Please amend the claims as follows:

Cancel claims 1-23.

Please add new claims 24-57 as follows.

24. (New) A process for producing bitumen having improved physicochemical properties comprising the steps of:

(a) combining amorphous silica with a coupling agent to produce a functionalized amorphous silica; and

(b) mixing the functionalized amorphous silica with bitumen.

25. (New) The process of claim 24, further comprising the step of heating the bitumen to a temperature of between about 120°C to about 190°C prior to mixing the functionalized amorphous silica with the bitumen.

26. (New) The process of claim 25, wherein the amorphous silica is a natural silica or a precipitated silica.

27. (New) The process of claim 26, wherein the amorphous silica is functionalized using a coupling agent selected from the group consisting of silicon, an alkylsilicon, an aminosilicon, a thiosilicon, an epoxysilicon and mixtures thereof.

28. (New) The process of claim 27, wherein the quantity of functionalized amorphous silica mixed with the bitumen is between about 0.01% and about 20% by weight compared to the weight of the bitumen formulation.

29. (New) The process of claim 28, wherein the quantity of functionalized amorphous silica mixed with the bitumen is between about 0.1% and about 7% by weight compared to the weight of the bitumen formulation.

30. (New) The process of claim 28, wherein the amorphous silica is a precipitated silica in the form of essentially spherical balls having an average size of at least 80 microns.

31. (New) The process of claim 30, wherein the amorphous silica is a low water uptake silica.

32. (New) The process of claim 24, further comprising the step of mixing an aggregate material with the bitumen.

33. (New) The process of claim 24, wherein the quantity of coupling agent combined with the amorphous silica is between about 0.1% to about 30% by weight compared to the weight of the amorphous silica.

34. (New) The process of claim 33, wherein the quantity of coupling agent combined with the amorphous silica is between about 5% to about 15% by weight compared to the weight of the amorphous silica.

35. (New) The process of claim 24, wherein the bitumen is selected from the group consisting of asphalt, maltha, a natural bitumen, a pyrobitumen, an artificial bitumen, or mixtures thereof.

36. (New) A process for producing an improved bitumen based coating comprising the steps of:

(a) mixing bitumen, water and an emulsifier at ambient temperature to form a bitumen emulsion;

(b) adding to the bitumen emulsion an amorphous silica combined with a coupling agent to form a functionalized amorphous silica;

(c) spreading the bitumen emulsion containing functionalized amorphous silica to obtain a uniform coating; and

(d) breaking the bitumen emulsion.

37. (New) The process of claim 36, wherein the amorphous silica is a natural silica or a precipitated silica.

38. (New) The process of claim 37, wherein the amorphous silica is functionalized using a coupling agent selected from the group consisting of silicon, an alkylsilicon, an aminosilicon, a thiosilicon, an epoxysilicon and mixtures thereof.

39. (New) The process of claim 38, wherein the quantity of functionalized amorphous silica mixed with the bitumen is between about 0.01% and about 20% by weight compared to the weight of the bitumen formulation.

40. (New) The process of claim 39, wherein the quantity of functionalized amorphous silica mixed with the bitumen is between about 0.1% and about 7% by weight compared to the weight of the bitumen formulation.

41. (New) The process of claim 39, wherein the amorphous silica is a precipitated silica in the form of essentially spherical balls having an average size of at least 80 microns.

42. (New) The process of claim 41, wherein the amorphous silica is a low water uptake silica.

43. (New) The process of claim 36, further comprising the step of mixing an aggregate material with the bitumen.

44. (New) The process of claim 36, wherein the quantity of coupling agent combined with the amorphous silica is between about 0.1% to about 30% by weight compared to the weight of the amorphous silica.

45. (New) The process of claim 44, wherein the quantity of coupling agent combined with the amorphous silica is between about 5% to about 15% by weight compared to the weight of the amorphous silica.

46. (New) The process of claim 36, wherein the bitumen is selected from the group consisting of asphalt, maltha, a natural bitumen, a pyrobitumen, an artificial bitumen, or mixtures thereof.

47. (New) A process for producing an improved bitumen based coating comprising the steps of:

(a) heating a quantity of bitumen to a temperature of between about 120°C and about 190°C;

(b) adding to the heated bitumen an amorphous silica combined with a coupling agent to form a functionalized amorphous silica;

(c) mixing the bitumen/functionalized amorphous silica, water and an emulsifier to form a bitumen emulsion;

(d) spreading the bitumen emulsion containing functionalized amorphous silica to obtain a uniform coating; and

(e) breaking the bitumen emulsion.

48. (New) The process of claim 47, wherein the amorphous silica is a natural silica or a precipitated silica.

49. (New) The process of claim 48, wherein the amorphous silica is functionalized using a coupling agent selected from the group consisting of silicon, an alkylsilicon, an aminosilicon, a thiosilicon, an epoxysilicon and mixtures thereof.

50. (New) The process of claim 49, wherein the quantity of functionalized amorphous silica mixed with the bitumen is between about 0.01% and about 20% by weight compared to the weight of the bitumen formulation.

51. (New) The process of claim 50, wherein the quantity of functionalized amorphous silica mixed with the bitumen is between about 0.1% and about 7% by weight compared to the weight of the bitumen formulation.

52. (New) The process of claim 50, wherein the amorphous silica is a precipitated silica in the form of essentially spherical balls having an average size of at least 80 microns.

53. (New) The process of claim 52, wherein the amorphous silica is a low water uptake silica.

54. (New) The process of claim 47, further comprising the step of mixing an aggregate material with the bitumen.

55. (New) The process of claim 47, wherein the quantity of coupling agent combined with the amorphous silica is between about 0.1% to about 30% by weight compared to the weight of the amorphous silica.

56. (New) The process of claim 55, wherein the quantity of coupling agent combined with the amorphous silica is between about 0.1% to about 30% by weight compared to the weight of the amorphous silica.

57. (New) The process of claim 47, wherein the bitumen is selected from the group consisting of asphalt, maltha, a natural bitumen, a pyrobitumen, an artificial bitumen, or mixtures thereof.